



ROLE OF HORSE-ASSISTED THERAPY IN THE REHABILITATION FIELD: PAST, PRESENT, AND FUTURE PERSPECTIVES

Dear Editor:

Central and peripheral nervous system lesions might induce paralysis, weakness, and/or loss of dexterity, which are the main target of rehabilitative interventions.¹ In fact, a specific training with intensive practice on actions in an appropriate context is mandatory to regain specific skills. Further, to reduce disability and improve quality of life in patients with disabilities, the individual also must take part in social and recreational activities. In this view, the rehabilitation environment, consisting of the physical setting, type, intensity and dosage of intervention, and knowledge and attitudes of the staff, has an important role in patient outcomes.² It is worthwhile to note that the environment needs to be functionally organized, depending on patient's disabilities to be trained.² Further, gains in motor improvement are negatively influenced by soft tissue adaptations induced by muscle weakness and postlesion inactivity and disuse.¹

Physical therapy practice has changed among the years, from the use of corrective exercise and muscle re-education applied early in the 20th century to treat poliomyelitis to the neurophysiological or neurofacilitation approaches applied following World War II to treat young adults with acute brain injury. Later on, Bobath³ (using Bobath therapy or neurodevelopmental therapy) and Kabat et al.⁴ (by means of proprioceptive neuromuscular facilitation) changed the focus from muscle to non-muscle elements. It was in the 1980s that how humans acquire and learn motor skills, together with psychology, muscle biology, and adaptability, became the new focus of the physical therapy practice.⁵

Moreover, neuroimaging and noninvasive mapping studies have demonstrated the potential of the adult cerebral cortex to undergo a functional reorganization, the so-called cortical plasticity, which better works when physiotherapy is started earlier.⁶

Nowadays, further developments in motion analysis and electromyography, demonstrating the kinematics and kinetics of each action and postural adjustments contribute to make

neurological rehabilitation a more deductive process.

Horse-assisted therapy (HAT) has emerged among innovative and alternative rehabilitation techniques⁷ able to improve the kinematics and kinetics of each action and postural adjustments.⁷ To this aim, Portaro et al. applied finite element analysis as a theoretical model,⁸ investigating the stress shielding through the skeleton of a rider during a horse therapeutic training and showing that the rider had to continuously adjust their movements to accommodate the mechanical interaction with the horse. Indeed, HAT stimulates motion, coordination, agility, and balance and reduces physical or postural asymmetry of the rider.⁸

Of note, the rehabilitation training must not be confined to the acute phase of the disabling event but should be considered a long-term process. In fact, one of the main concerns of physiotherapy is the management of the patient after discharge, since post-discharge services for individuals with chronic disability are lacking.⁹ The provision of facilities directed to all disability levels requires collaboration between public health and community services.

However, how might HAT overcome such issues? HAT consists of the application of a horse in a therapeutic setting, using the rhythmic horse's back movements, which induce continuous adaptive stimulations to the rider, altering motor output in response to vestibular, proprioceptive and psychosomatic stimulation.^{7,8} Indeed, HAT provides an afferent stimulus, reducing spasticity and promoting alignment and posture control.^{7,8}

As the American Hippotherapy Association stated, there are two main forms of horse therapy, (1) one being using the equine movement and the environment of the horse to gain the therapeutic goals in one-to-one session between the therapist and patient (namely, HAT) and (2), the other one, provided in groups, implying recreational horseback riding lessons adapted for disabled patients.¹⁰

The rationale of HAT consists of the rhythmic movement induced by the horse pace to the patient. The use of a horse as a cophysiotherapist has old roots. Over the years, its efficacy has been demonstrated to improve balance, functional capacity, posture, spasticity, and gait ability in several neurological

disorders.⁷ In all cases, HAT can be considered as a neuromuscular re-education technique, improving muscle strength, relaxation, body awareness, balance, tone, gait, coordination, posture, and quality of life.^{7,8}

As compared with conventional rehabilitation training, HAT provides an additional element: the possibility for the rider to interact in a positive and enjoyable environment, which is psychologically helpful, improving confidence, self-esteem, and motivation.^{7,8}

Finally, based on the patient's clinical condition, there could be a possibility to continue treatment at a sportive level in paralympic sport activities, with a consequential further implication in social acceptance and functioning.

Unfortunately, to date, there are no standardized guidelines for HAT application. Methods are usually defined based on the clinician's skills and whether the benefit is determined by the dosage of therapy or the way of its administration or by the causative disease are still under debate. In addition, considering that HAT programs are not always applied by expert clinicians or under clinician supervisors with expertise in interventions with animals, we should concentrate our efforts on the definition of standardized protocols for different neurological diseases to obtain improved and beneficial results from such therapy.

In conclusion, we may argue that HAT is a comprehensive rehabilitation treatment, covering the motor, cognitive, psychological, and social fields, that, if properly administered, might facilitate important results in several neurological disorders.

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With regards,

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